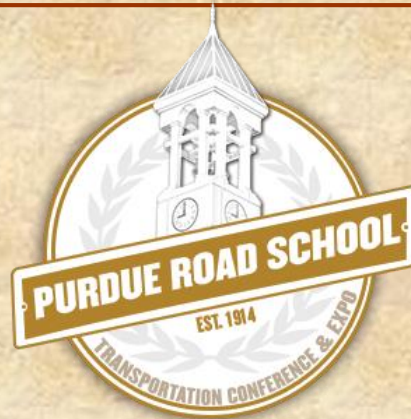


2016 PURDUE ROAD SCHOOL



Impact Fees Based on ITE Trip Generation - Cautions

March 9, 2016

W. Lafayette, IN

Presented by:

Eric J. Tripi, P.E., PTOE

PARSONS

Agenda



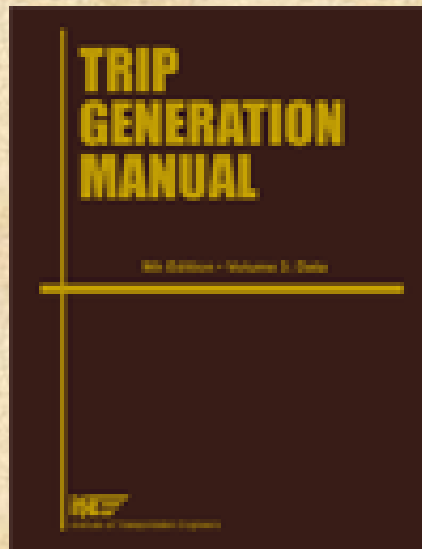
- Trip Generation Resources
- Basic of ITE Trip Generation
- Traffic Impact Fees – Two Case Studies
- Final Thoughts

...Questions

- **Trip Generation Resources**

Trip Generation Resources

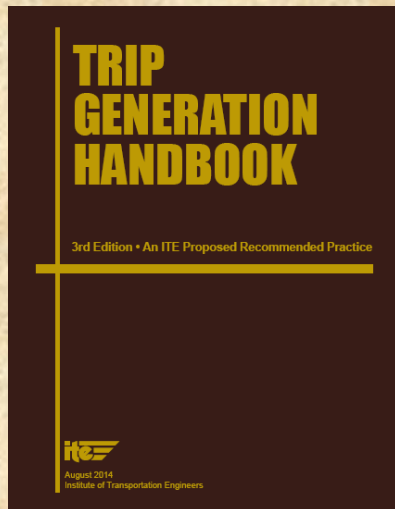
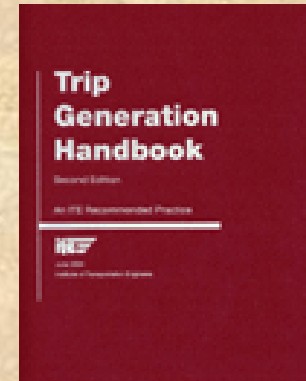
- Trip Generation Manual, 9th Edition, 2012
 - Volume 1 – User's Guide and Handbook
 - Volumes 2 and 3 – Data



Trip Generation Resources



- Trip Generation Handbook, 2nd Edition: An ITE Recommended Practice, 2004



- Trip Generation Handbook, 3rd Edition: An ITE Recommended Practice, 2014

- **Basics of ITE Trip Generation**

Basics of ITE Trip Generation

- Who is ITE
 - Institute of Transportation Engineers
 - Founded in 1930
 - Nearly 17,000 members in 92 countries
 - Over 90 local chapters and 130 student organizations
 - Educational and Scientific organization

Basics of ITE Trip Generation

- What is Trip Generation?
 - *The estimated peak hour and daily site traffic volumes for a particular land use.*
 - *Involves development of relationships between vehicle trips and land use characteristics*

Basics of ITE Trip Generation

- ITE Trip Generation
 - Data assembled from more than 4,800 individual studies in United States and Canada since the 1960s
 - Mainly collected at suburban locations
 - With limited transit service
 - Without nearby pedestrian amenities
 - Without travel demand management (TDM) programs
 - Data received on “voluntary” basis

Basics of ITE Trip Generation

Trip Generation Uses

- Regional studies
 - Considers land use and socio-economic characteristics
- Site impact analysis
 - Analysis of trip generation of specific land uses
- Zoning and land use planning applications
- Sizing transportation system and individual facilities
- **Impact fee determination**
- Environmental assessment
 - Traffic impacts on air and noise

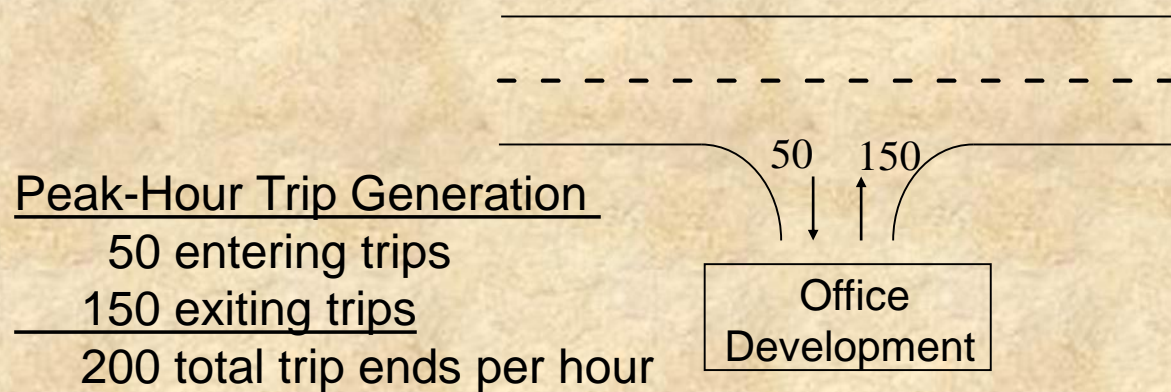
Basics of ITE Trip Generation

■ Definitions

- *Pass-by trip* – intermediate stop on way from origin to primary destination
- *Primary trip* – made for specific purpose of visiting generator
- *Diverted Trip* – attracted from traffic volumes on roadways within vicinity of generator but without direct access to site

Basics of ITE Trip Generation

- A Trip or Trip End
 - Single or one-directional vehicle movement to or from a site/area
 - One-way movement

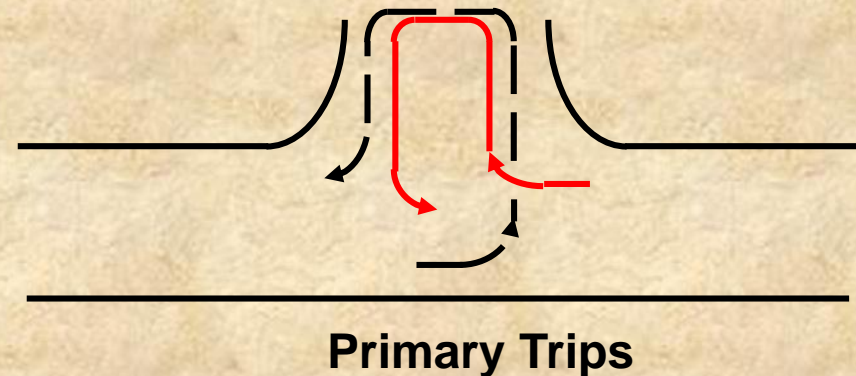


- Total Trip Ends
 - Total of all trips entering and exiting a site during a designated time period

Basics of ITE Trip Generation

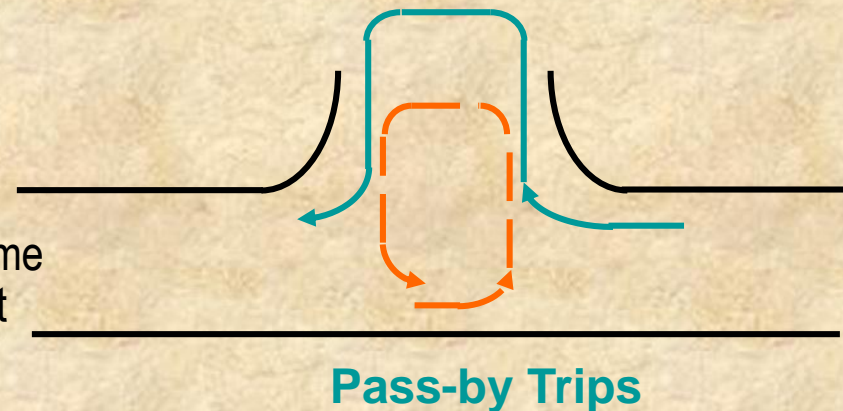
■ Primary trips

- Main reason for a trip
- Upon exit, trips will travel back in the direction from which they came



■ Pass-by trips

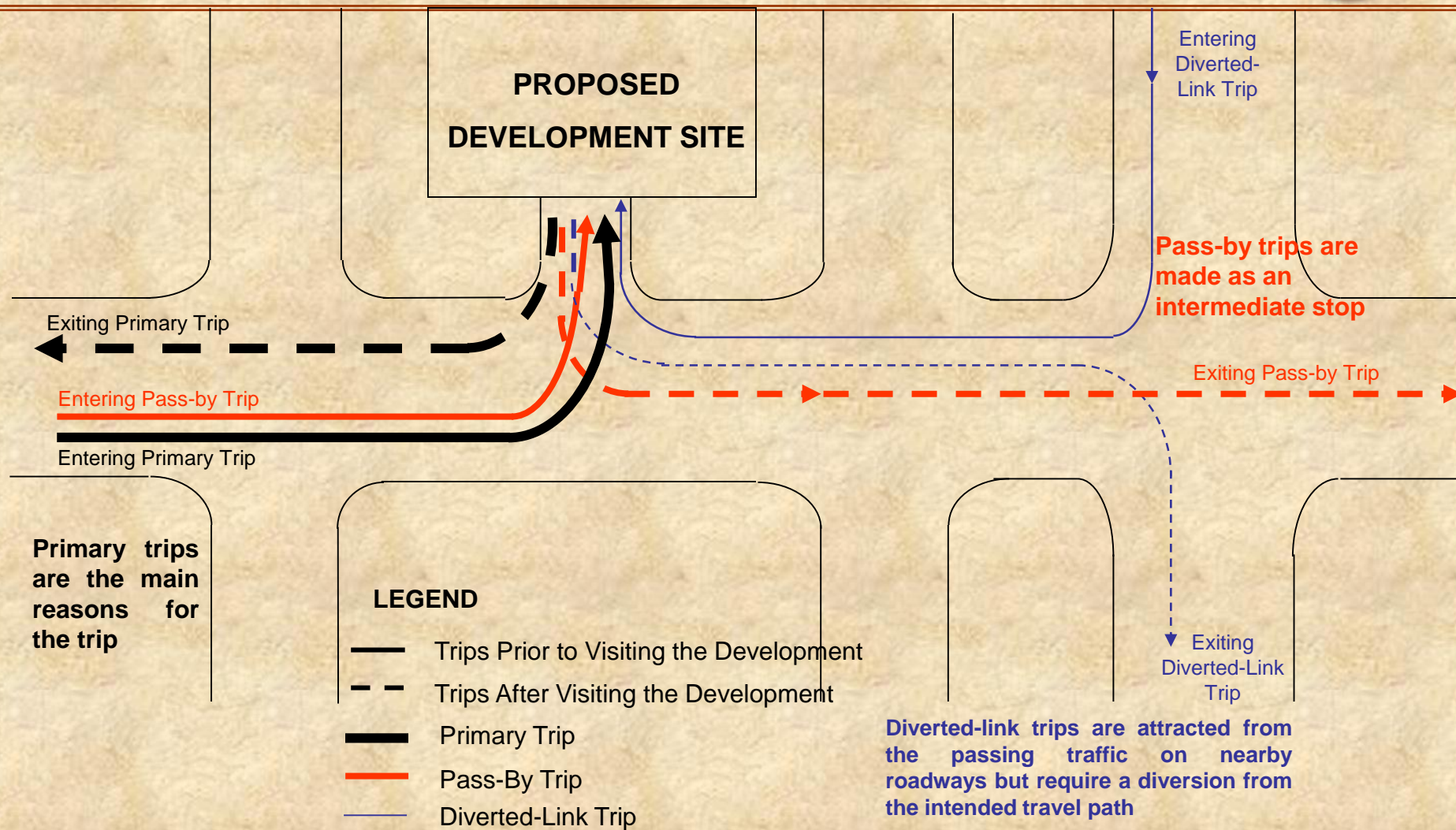
- Trips made as an intermediate stop
- Upon exit, trips will continue to travel in the same direction they were traveling before stopping at the site
- NOT a NEW trip



Basics of ITE Trip Generation

- Diverted Trips
 - Trips that are diverted from nearby roadways and required to use another roadway to access site
 - Adds traffic to streets directly adjacent to development site - not to nearby major roadways
 - Direction of travel upon exit may be similar to that of pass-by trips
 - Difficult to identify

Basics of ITE Trip Generation



- **Traffic Impact Fees – Two Case Studies**

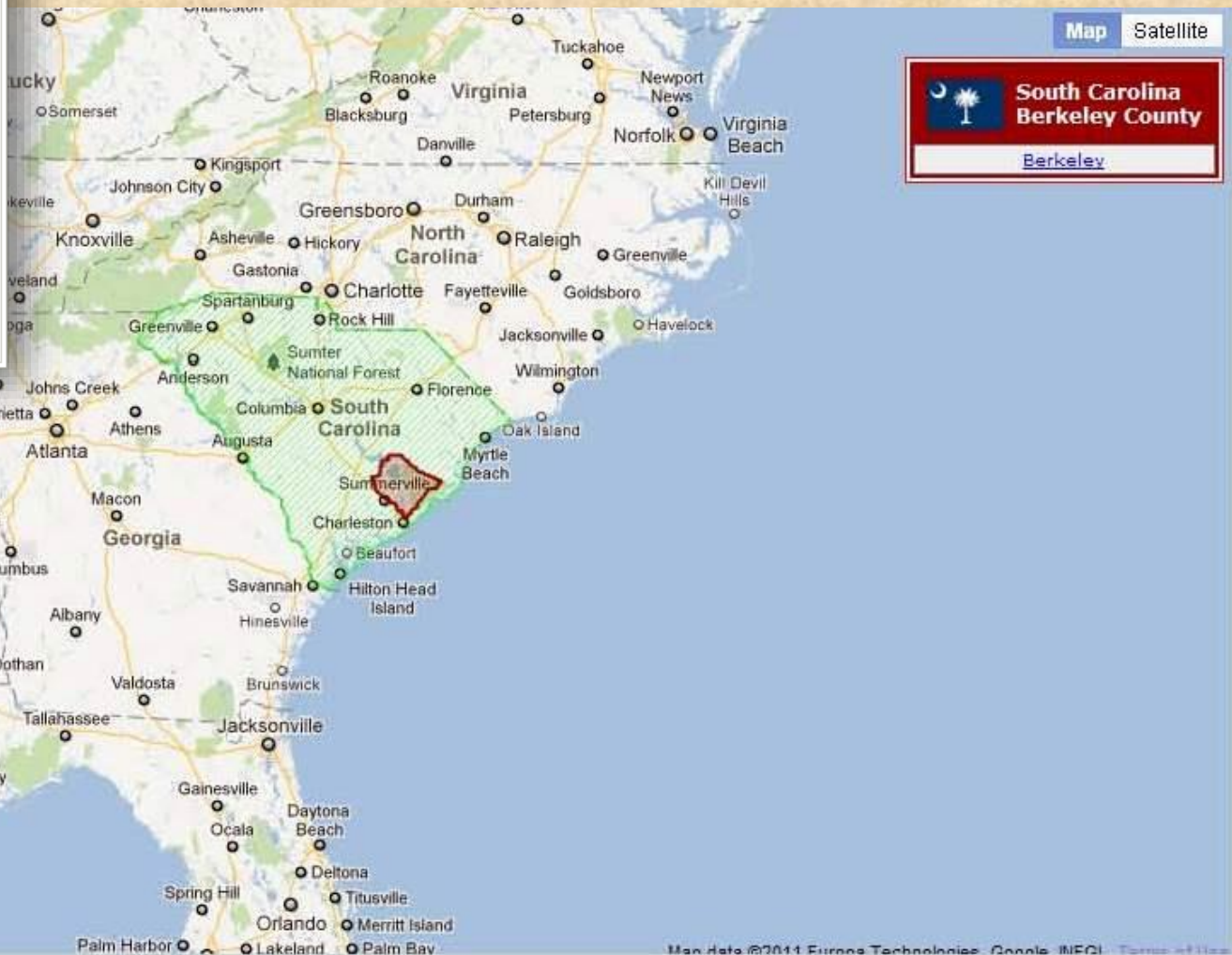
- **Traffic Impact Fees – Two Case Studies**

What is a Traffic Impact Fee?

- **Traffic Impact Fee** – *used for new development and intensified land uses that will fund transportation improvements such as new sidewalks, crosswalks, traffic signal upgrades, transit, and bicycle facilities that are necessitated by the new trips associated with land use change.*

– City of Santa Monica Planning and Community Development

Berkeley County, SC Impact Fee Ordinance





Berkeley County, SC Impact Fee Ordinance

- Berkeley County, SC has an Impact Fee Ordinance
- Two existing businesses wished to build new facilities in Berkeley County, SC
- Each owner was assessed an Impact Fee they were not happy about...
- ...so we were called to assess the situation.

Berkeley County, SC Impact Fee Ordinance

- Berkeley County Ordinance – Impact Fee Calculations

$$\text{Impact Fee} = (\text{NNWT}) \times (\text{TED}) \times (\text{COST}) \times (\text{CDR})$$

Where:

NNWT = Net New Weekday Trips (includes pass-by and capture trip reductions)

TED = Trip end discount of 50%

COST = Cost per trip for Service Zone 1, \$402.25

CDR = Per County Council Policy – 70% of maximum allowable impact fee will be charged (85% for *Independent Studies*).

Berkeley County, SC Impact Fee Ordinance



06-11-75
Page 11

Exhibit B
General Transportation Impact Fee Schedule - Service Zone 1¹

Type of Land Use ²	ITE Code	Daily Trip Generation Rate ³	Pass-by Percentage ⁴	Discounted Impact Fee ⁵
Residential				
Single Family (per dwelling unit)	210	9.57	0%	\$1,348
Apartment (per dwelling unit)	220	6.72	0%	\$ 946
Condominium/Townhome (per dwelling unit)	230	5.86	0%	\$ 825
Mobile Home Park (per occupied dwelling unit)	240	4.99	0%	\$ 703
Senior Adult Housing (per dwelling unit)	250	3.71	0%	\$ 522
Congregate Care Facility (per dwelling unit)	253	2.02	0%	\$ 284
Hotel (per occupied room) ⁶	310	8.92	0%	\$1,256
Recreational				
Golf Course (per hole)	430	25.74	0%	\$5,032
Multiplex Movie Theater (per 1,000 sf) ⁷	445	42.66	0%	\$6,006
Health/Fitness Club (per 1,000 sf) ⁷	492	32.93	0%	\$4,636
Bowling Alley (per 1,000 sf) ⁷	437	33.33	0%	\$4,692
Institutional				
Elementary School (per 1,000 sf) ⁷	520	14.49	0%	\$2,040
Middle/Junior High School (per 1,000 sf) ⁷	522	13.78	0%	\$1,940
High School (per 1,000 sf) ⁷	530	12.89	0%	\$1,815
Junior/Community College (per 1,000 sf) ⁷	540	27.49	0%	\$3,870
University/College (per student) ⁷	550	2.38	0%	\$ 335
Church (per 1,000 sf) ⁷	560	9.11	0%	\$1,282
Daycare (per student)	565	4.48	0%	\$ 631
Medical				
Hospital (per bed)	610	11.81	0%	\$1,663
Clinic (per employee)	630	7.75	0%	\$1,091
Nursing Home (per bed)	620	2.37	0%	\$ 334
General Office (per 1,000 sf)				
< 50,000 sf	710	15.65	0%	\$2,204
50,000 – 100,000 sf	710	14.25	0%	\$2,006
100,001 – 200,000 sf	710	12.15	0%	\$1,711
> 200,000 sf	710	11.37	0%	\$1,601
General Retail (per 1,000 sf)				
< 50,000 sf	820	86.56	48%	\$6,337
50,000 – 100,000 sf	820	75.10	42%	\$6,090
100,001 – 200,000 sf	820	58.92	35%	\$5,417
> 200,000 sf	820	53.28	32%	\$5,101
Industrial				
General Light Industrial (per 1,000 sf) ⁷	110	6.97	0%	\$ 981
General Heavy Industrial (per 1,000 sf) ⁷	120	1.5	0%	\$ 211
Industrial Park (per 1,000 sf) ⁷	130	6.96	0%	\$ 980
Warehousing (per 1,000 sf) ⁷	150	4.96	0%	\$ 699
Mini-Warehouse (per 1,000 sf) ⁷	151	2.5	0%	\$ 352
Services				
Drive-In Bank (per 1,000 sf) ⁷	912	246.89	47%	\$18,593
Gas Station w/Convenience Store (per pump)	945	162.78	62%	\$8,709
High Turnover Sit Down Restaurant (per 1,000 sf) ⁷	932	127.15	43%	\$10,204
Fast Food w/Drive-Thru Window (per 1,000 sf) ⁷	934	496.12	50%	\$34,924
Automobile Care Center (per 1,000 sf) ⁷	942	29.4	0%	\$4,139

Notes:

Type of Land Use ²	ITE Code	Daily Trip Generation Rate ³	Pass-by Percentage ⁴	Discounted Impact Fee ⁵
General Office (per 1,000 sf)				
< 50,000 sf	710	15.65	0%	\$2,204
50,000 – 100,000 sf	710	14.25	0%	\$2,006
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Two Independent Impact Fee Studies

- What kind of land use is this?
 - Sells motorcycles, watercrafts, ATV's, utility vehicles
 - Sells parts
 - Provides on-site service
 - Typically low number of employees (<20)
 - Building space dedicated to showroom, service area, and storage

Two Independent Impact Fee Studies

SITE #1

- Existing Site Characteristics
 - Building – 5,000 sf, with additional 1,250 sf of storage outside the building
 - 7 employees
 - Open 10AM-6PM, Mon-Sat
- Future Site Characteristics
 - 17,000 sf
 - 7 Employees
 - Open 10AM-6PM, Mon-Sat

Two Independent Impact Fee Studies

SITE #2

- Existing Site Characteristics
 - Building – 9,950 sf, with additional 15,820 sf of storage outside the building
 - 15 employees
 - Open 9AM-6PM, Mon-Sat
- Future Site Characteristics
 - 43,559 sf
 - 15 Employees
 - Open 9AM-6PM, Mon-Sat

Two Independent Impact Fee Studies

- Site #1
 - Assessed \$41,700 in impact fees based on existing Berkeley County Ordinance methodologies
- Site #2
 - Assessed \$126,000 in impact fees

Two Independent Impact Fee Studies

- Impact Fee Calcs for Site #1 (per County Ordinance):

17,000 Square Feet of Future Building Area

Apportioned:

11,000sf = Warehouse (11 x 4.96 = 55 Trips)

5,000sf = Retail (5 x 86.56 = 433 Daily Trips x .52 Pass-by = 225 Trips)

1,000sf = Office (1 x 15.65 = 16 Trips)

NNWT = Net New Weekday Trips (296 Trips)

$$\begin{aligned}\text{Impact Fee} &= (\text{NNWT}) \times (\text{TED}) \times (\text{COST}) \times (\text{CDR}) \\ &= (296) \times (0.50) \times (402.25) \times (0.70) = \$41,673\end{aligned}$$

Total Fee = \$41,673



Two Independent Impact Fee Studies

Type of Land Use ²	ITE Code	Daily Trip Generation Rate ³	Pass-by Percentage ⁴	Discounted Impact Fee ⁵
General Office (per 1,000 sf)				
< 50,000 sf	710	15.65	0%	\$2,204
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Mini-Warehouse (per 1,000 sf) ⁷	151	2.5	0%	\$ 352

Two Independent Impact Fee Studies

- Data Collection for Independent Study (per Berkeley County Ordinance)
 - Surveyed Ins/Outs of existing sites during business hours
 - Study conducted on an average weekday (Tuesday-Thursday) for two different weeks
 - Classified number of Motorcycles versus Cars/Trucks trips

Two Independent Impact Fee Studies

- Conclusions of Site #1 Independent Study

DAILY TRIP GENERATION – SITE #1

	VEHICLE TYPE	IN	OUT	TOTAL
	Car/Truck	29	29	58
	Motorcycle	11	11	22
	Total	40	40	80
	Car/Truck	34	34	68
	Motorcycle	1	1	2
	Total	35	35	70
Average Daily Trips		38	38	76

Two Independent Impact Fee Studies

- Conclusions of Site #1 Independent Study
 - 76 average daily trips
 - Conservative assumption that 25% of the trips are pass-by in nature
 - NNWT value of $76 \times 0.75 = 57$ was used (vs. 296)
 - The Impact Fee becomes:

$$\text{Impact Fee} = (57) \times (0.50) \times (\$402.25) \times (0.85) = \$9,744.51$$

A \$33,000 Savings...

Two Independent Impact Fee Studies

BUT WAIT....THE NEW BUILDING IS BIGGER!!!

Doesn't this mean there will be more trips?

Not necessarily...

- Number of Employees to remain the same
- Much of the increased space being used for storage and workshop
- No new services offered
- Hours of operation remain the same



Two Independent Impact Fee Studies

BUT WAIT AGAIN....YOU DIDN'T THINK IT WOULD BE THAT
EASY DID YA?

Final Agreement

- County Comments/Recommendations for Site #1 Study:
 - 25% Pass-by assumption ok
 - Insisted the site would generate additional trips with larger building
 - Compromise: assume existing building square footage is 50% bigger
 - Thus NNWT value increases to 117.97
 - The Impact Fee becomes:

$$\text{Impact Fee} = (117.97) \times (0.50) \times (\$402.25) \times (0.85) = \$20,167.71$$

Still a \$21,410 Savings

Final Agreement

SITE #2

- Existing Site Characteristics
 - Building – 9,950 sf, with additional 15,820 sf of storage outside the building
 - 15 employees
 - Open 9AM-6PM, Mon-Sat
- Future Site Characteristics
 - 43,559 sf
 - 15 Employees
 - Open 9AM-6PM, Mon-Sat

Final Agreement

- Conclusions of Site #2 Independent Study

DAILY TRIP GENERATION – SITE #2

VEHICLE TYPE	IN	OUT	TOTAL
Car/Truck	109	111	220
Motorcycle	20	19	39
Total	129	130	259
Car/Truck	129	129	258
Motorcycle	6	6	12
Total	135	135	270
Daily Trips (Average February)	132	133	265
Daily Trips (Average Month)	161	162	323

Final Agreement

■ Conclusions of Site #2 Independent Study

- 323 average daily trips
- Conservative assumption that 25% of the trips are pass-by in nature
- Assumed existing square footage was 50% higher (per prior study County recommendation)
- NNWT value of 316 was used.
- The Impact Fee becomes:

$$\text{Impact Fee} = (316) \times (0.50) \times (\$402.25) \times (0.85) = \$54,022.18$$

A \$72,000 Savings

Final Agreement

■ County Comments/Recommendations on Site #2 Study:

- 25% Pass-by assumption ok
- Compromise: assume existing building square footage is 20% bigger (on top of the 50% increase)
- Thus NNWT value increases to 380
- The Impact Fee becomes:

$$\text{Impact Fee} = (380) \times (0.50) \times (\$402.25) \times (0.85) = \$64,963.38$$

Still a \$61,000 Savings

Final Thoughts

- Moral of Story:

ITE Trip Generation used to calculate Impact Fees needs to be carefully reviewed – especially for small unique developments.



Questions?

Thank You!

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